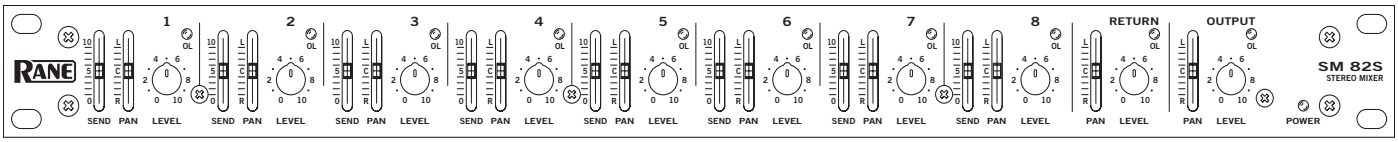


QUICK START

No one likes to read manuals. Everyone likes to just start pushing buttons and turning knobs until the desired results magically emerge. That's usually OK, and with a very few exceptions, damage is unlikely to result from such procedures with the SM 82S.

This product is quite obvious: Input **LEVEL** controls make Inputs louder or not, the stereo **SEND**s make things happen at the **LOOP SEND** outputs, and so on. No real magic there. You should be aware, however, that if you want to connect a mono source to the SM 82S, use only the **LEFT** Input of a channel so that the mono source will drive both the Left and the Right channels.

Set the levels of the mixer so that the red lights stay off. If they come on, you are overdoing it and distortion will result.

SM 82S CONNECTION

When connecting the SM 82S to other components in your system for the first time, *leave the power supply for last*. This will give you a chance to make mistakes and correct them before any damage is done to your fragile speakers and ears.

If you are making your own cables, or experience any hum problems after hookup, please refer to the RaneNote, "Sound System Interconnection" (supplied with this manual and available at www.rane.com).

INPUTS

The SM 82S's Inputs are unbalanced. This means that standard ¼" connectors on the ends of any good quality cable will work well between your signal sources, signal processing and amplification. For best rejection of nasty things like hum and RF, keep input cables under 10 feet (3 meters) in length.

Most sources give you the choice of stereo or mono output. The mixer gives you the same choice. You will note that nomenclature has been placed beneath the input jacks indicating which is RIGHT and which is LEFT (MONO). If a source is plugged only into the Left jack and not into the Right, both Right and Left channels will be fed with the Left Input. This allows the use of either stereo or mono sources.

OUTPUTS

The SM 82S offers balanced main outputs only. This means that you may use them as either balanced or unbalanced, the choice being made by the way the connectors are wired. It's a good idea to always use a TRS or stereo connector in the outputs no matter which mode you are using. If a "mono" connector is used, inserting it into the output will short the ring (–) to ground and could conceivably cause a small amount of distortion to be placed on the tip (+). While this is not destructive, it may be significant enough to be audible. Balancing therefore requires that both tip (+) and ring (–) be wired to the following device. Unbalanced requires only tip and sleeve connected, leaving the unused ring open.

EFFECTS DEVICES

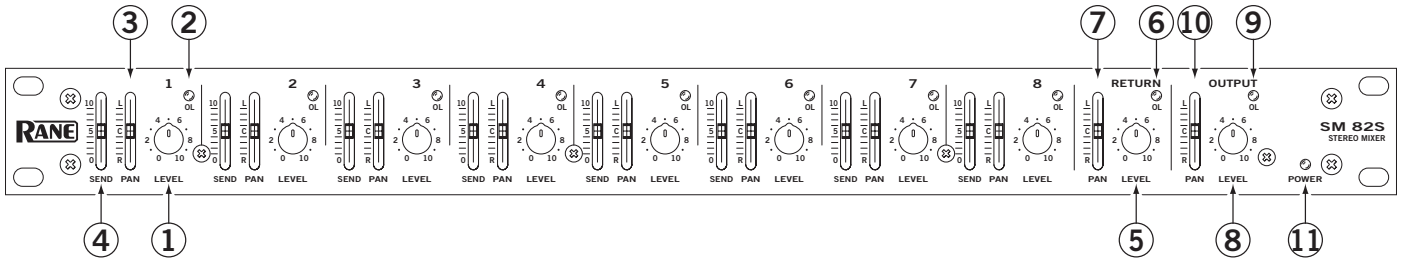
External devices which might be used could be either mono in and out, while some may be mono in and stereo out, while still others may be stereo on both ends. The SM 82S easily accommodates all of these varieties. If your effect is mono on both ends, connect its input to the SM 82S LEFT LOOP SEND and the effect's output to the SM 82S LEFT LOOP RETURN. This configuration will sum Right and Left Loop Outputs to the mono effect input and will sum the mono effect output to the Left and Right Input buses. A mono-in stereo-out device would connect to the loop outputs in the same way; however the stereo outputs connect to the respective LEFT and RIGHT LOOP RETURNS.

EXPANDING

Connecting two or more SM 82Ss together to achieve more than eight stereo Inputs requires that a stereo cable (tip, ring, sleeve) be connected between the MAIN EXPAND OUTPUT of the first mixer and the MAIN EXPAND INPUT of the second. All 32 inputs will then appear at the main OUTPUT of mixer number two. Only the first sixteen Inputs will be available at the main Outputs of mixer number one. Should you wish to have all Loop buses tied, connect the LOOP SENDS of mixer one to the LOOP EXPAND INPUT of mixer two. All sixteen stereo sends will then become active at the LOOP SENDS of the second mixer.

WEAR PARTS: This product contains no wear parts.

FRONT PANEL DESCRIPTION



① **Input LEVEL controls:** are rotary stereo attenuators that adjust the amount of both Left and Right signals applied to an Input. Outputs are summed for mixing with all other Inputs. The unity gain position of this control is located at "7.5."

② **Input OverLoad indicators:** glow red whenever its corresponding Input's output exceeds a level 4 dB below clipping, letting you know it's a good idea to turn this Input down a bit.

③ **Input PAN controls:** operate as 'PAN' with a mono signal, and 'BALANCE' with a stereo signal.
PAN: When a mono input is used (no plug in the RIGHT Input jack), the signal 'moves' from the Left to Right channels. At the "L" extreme top of travel the sound source is heard from the Left output; at the other "R" extreme bottom it is heard only from the Right output. In the middle, the sound is heard equally from each output, but is reduced in level by 3 dB relative to its original value. This guarantees that as the sound is panned from one side to the other, it maintains equal loudness (power) for all positions.
BALANCE: In its center detent, Left and Right signals to each channel are allowed to pass at their original relative levels, therefore preserving the stereo image from devices connected to both of the Inputs. When the control is moved vertically toward the "L" position, the Right channel level is *decreased* while the Left channel level is *maintained*. The opposite occurs if the control is moved from the detent down toward the "R".

④ **Input SEND Level controls:** determine the amount of *Post-Fade* stereo Input is fed to the Loop Send buses. Each Input's stereo SEND is summed on this bus and is available at the respective LEFT and RIGHT LOOP SENDS on the rear of the mixer.

⑤ **RETURN LEVEL control:** is a rotary stereo attenuator that controls the amount of Return which is to be added to the Main Output. The unity gain position of this control is located at "7.5."

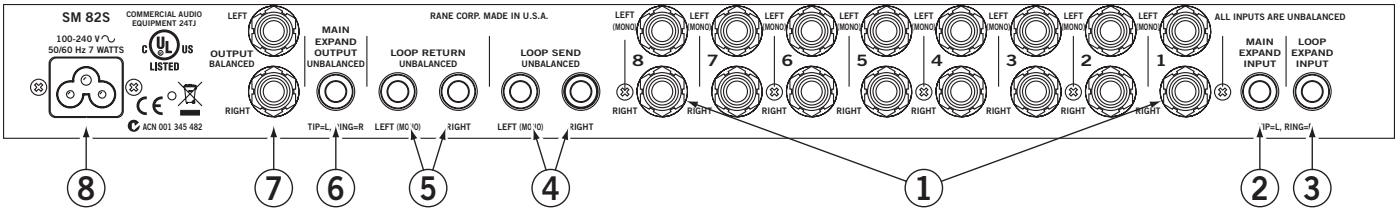
⑥ **RETURN OverLoad indicator:** glows red whenever the return levels exceed a level of 4 dB below clipping.

⑦ **RETURN PAN control:** is a vertical slider that controls the effect or source connected to the LOOP RETURN in the same way the Input PAN controls work (see ③ above).

⑧ **OUTPUT LEVEL control:** is a rotary stereo attenuator that controls the final signal Level at the main OUTPUT jacks. The unity gain position of this control is located at "7.5".

⑨ **OUTPUT OverLoad indicator:** glows red any time the output level exceeds 4 dB below clipping.

⑪ **OUTPUT PAN control:** is a vertical slider that operates in the same fashion as the PAN control described in item ③ above. It however, determines the relative levels of the LEFT and RIGHT MAIN OUTPUTS only.



① **Channel Input jacks:** consist of eight pairs of unbalanced ¼" tip-sleeve jacks, used to connect any line-level signal source to the SM 82S. As indicated, only the LEFT is to be used if the Input is mono and should therefore appear in both Left and Right channels, depending on the position of the front panel PAN control.

② **MAIN EXPAND INPUT:** A ¼" TRS stereo Input jack may link two or more SM 82Ss together, or accept the output from another mixer. This may also be used to sum any fixed-level stereo signal into the Main Outputs, producing a *ninth* stereo Input when added with ①. A stereo Tip-Ring-Sleeve cable must be used here. The Left input is on the Tip, Right is on the Ring and the Sleeve is ground.

③ **LOOP EXPAND INPUT:** Another ¼" TRS stereo Input, expands the stereo Loop buses of two SM 82Ss so they share the same effects loop. A stereo Tip-Ring-Sleeve cable must be used here. Connect the LEFT and RIGHT LOOP SENDS (④) of the first unit to the LOOP EXPAND INPUT of the second SM 82S. (Tip = left; Ring = right.)

④ **LOOP SEND:** This pair of ¼" jacks may drive an effect or similar device which is to be returned to item ⑤ below. If a mono device is used, both the Left and Right Send channels of the SM 82S are summed together and presented at the LEFT Output if nothing is inserted in the RIGHT Output.

⑤ **LOOP RETURN:** These ¼" aux returns may connect the output of a reverb or other effect unit to the Loop bus of the SM 82S. If no effect is used, they can be used as a *tenth* stereo Input to the mixer in addition to those described in ① and ②. As with the other stereo Inputs, mono signal may be connected to the LEFT input to obtain two-channel mono operation.

⑥ **MAIN EXPAND OUTPUT:** This ¼" TRS stereo (Tip = left, Ring = right) Output jack connects one SM 82S to another for the purpose of expanding the number of Inputs available. Use only a stereo plug in this jack — a mono jack or cable will cause loss of Right channel signal and possibly distortion to the Left channel. This Output also serves as a fixed pre-fader level useful as record outputs or other applications. You may use a send/return cable to drive a

⑦ **Main BALANCED OUTPUT:** These balanced Tip-Ring-Sleeve jacks connect the main Outputs of the SM 82S to a power amplifier or to additional signal processing. As is the AES standard with all Rane balanced outputs using ¼" TRS jacks, the Tip is (+), the Ring is (–) and the Sleeve is ground.

⑧ **Power connector:** The internal universal switching power supply operates on any AC mains 100 to 240 VAC, 50 or 60 Hz (most places in the world). All that is required when traveling is the appropriate IEC line cord.

OPERATING INSTRUCTIONS

CIRCUIT DESCRIPTION

Learning to operate the SM 82S might be a bit easier if you glance at the Block Diagram below. All eight stereo Inputs operate in exactly the same way. Signal applied to the Inputs is acted on by a radio interference filter (we have assumed that local broadcasts should not be a part of your music) and is then routed to a stereo LEVEL control. If you are using a mono source, connect it only to the LEFT Input to send this mono signal to both the Left and Right sides of the input circuitry. The output of the Level control sections is applied to a unity gain buffer to prevent the LEVEL control from adversely interacting with downstream circuitry. The Input overload sensor monitors here to alert the user via LED to any possible Input overload conditions. Left and Right audio is then subjected to the channel PAN control to allow the user to place the stereo image of the source as desired to the Left and Right Outputs. A stereo SEND control adjusts the amount of each Input routed to the Loop Output.

All eight stereo Inputs are simultaneously adjusted for stereo placement by the OUTPUT PAN control. The resultant signal is added together and fed to the OUTPUT LEVEL control, which has it's own Overload indicator. The main Outputs are fully actively balanced, allowing the use of correctly wired long cables.

EFFECTS LOOP

The LOOP SENDS receive their audio from the Send bus which is the sum of all the Inputs as determined by the Input SEND controls. This Output may be used to drive a stereo effects processor. The output of the effect device is returned to the SM 82S through the LOOP RETURNS. The level of the returned effect is determined by the RETURN LEVEL control on the front panel. The return section also provides a BALance control for image placement.

PAN / BALANCE CONTROLS

These operate as 'PAN' with a mono signal plugged in the LEFT input only, and 'BALANCE' with a stereo signal (both jacks plugged in). These do not increase the level of either Left or Right signal. As the controls are moved toward one channel, the level of the other channel is only reduced.

HIGH NOISE IMMUNITY

One of the most unusual features of the SM 82S is its inherent immunity from noise. All eight of the stereo inputs may be turned all the way up without increasing the internal noise of the mixer. This is critical due to the wide variation in output levels found in musical instruments and tape devices. A fairly low-level guitar may be combined in the same system with a high level synthesizer without any undesirable side-effects. The SM 82S eliminates the concerns normally associated with mixing so-called -l0 dBV units with +4 dBu types.

Block Diagram